Means to Solve the Problems

[0010]   In order to achieve the aforementioned object, the program execution device according to the present invention is a program execution device that executes a program, the program execution device including: a first program selection unit which selects, as a program to be executed, a program which is downloaded and executed; a program monitoring unit which monitors an operational state of a currently executed program; a second program selection unit which selects, as a program to be executed, a program that is of the same type as the currently executed program, in the case where abnormal termination of the currently executed program is detected by the program monitoring unit; an execution unit which executes the program selected by the first program selection unit and, in the case where abnormal termination of the currently executed program is detected by the program monitoring unit, executes the program selected by the second program selection unit; a cause obtainment unit which obtains a cause of the abnormal termination of the program detected by the program monitoring unit; and a countermeasure execution unit which executes a countermeasure based on the cause of the abnormal termination, wherein the execution unit executes the program selected by the second program selection unit, after the countermeasure is executed by the countermeasure execution unit. Accordingly, even when the currently executed program abnormally terminates, it is possible to maintain a situation in which the program is always operating, by executing a program which is of the same type as the program which abnormally terminated. Here, a program of the same type refers to a program having the same function of, for example, displaying an electronic program guide, and different user operability or display characteristics such as the amount of information in the display information and the display format.   Moreover, in programs of the same type, the same

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program as the program that abnormally terminated is also included.

[0011]   Furthermore, it is also possible that the second program selection unit selects, as the program to be executed, a program which is different from the program selected by the first program selection unit. Accordingly, it is possible to execute a different program that is of the same type as the program that abnormally terminated.

[0012]   Furthermore, it is also possible that the second program selection unit selects, as the program to be executed, a program which is the same as the program selected by the first program selection unit. Accordingly, it is possible to execute, once again, the same program as the program that abnormally terminated.

[0013]   Furthermore, it is also possible that the second program selection unit selects, as the program to be executed: a program which is the same as the program selected by the first program selection unit, in the case where a predetermined condition is not satisfied; and a program which is different from the program selected by the first program selection unit, in the case where the predetermined condition is satisfied. Accordingly, it becomes possible to activate the same program as the initial program only for a fixed period and, subsequently, execute a different program.

[0014]   Furthermore, it is also possible that the program monitoring unit, upon detecting abnormal termination of the currently executed program, presents an occurrence of the abnormal termination to a user. Accordingly, it becomes possible for the user to recognize that abnormal termination of the currently executed program has occurred.

[0015]   Furthermore, the program execution device according to the present invention is a program execution device that executes a program, the program execution device including: a first program

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selection unit which selects, as a program to be executed, a program which is downloaded and executed; a program monitoring unit which monitors an operational state of a currently executed program; a second program selection unit which selects, based on an instruction

5 from a user, a program that is of the same type as the currently executed program, as a program to be executed, in the case where abnormal termination of the currently executed program is detected by the program monitoring unit; and an execution unit which executes the program selected by the first program selection unit

10 and, in the case where abnormal termination of the currently executed program is detected by the program monitoring unit, executes the program selected by the second program selection unit. Accordingly, it becomes possible to execute the program instructed by the user.

15 [0016] Furthermore, it is also possible that the second program selection unit presents selectable program candidates, and selects a program selected by the user, as the program to be executed. Accordingly, it becomes possible to execute the program selected by the user. Likewise, it becomes easy for the user to

20 determine the program to be executed.

[0017] Furthermore, it is also possible that the second program selection unit selects a predetermined program, as the program, in the case where the user does not make a selection within a predetermined time. Accordingly, it becomes possible to

25 select a program even when the selection by the user is not made within a predetermined period of time.

Furthermore, the program execution device according to the present invention is a program execution device that executes a program, the program execution device including: a first program

30 selection unit which selects, as a program to be executed, a program which is downloaded and executed; a program monitoring unit which monitors an operational state of a currently executed program; a

second program selection unit which selects, as a program to be executed, a program that is of the same type as the currently executed program and which accepts a channel selection request from a user and performs an operation, in the case where abnormal termination of the currently executed program is detected by the program monitoring unit; and an execution unit which executes the program selected by the first program selection unit and, in the case where abnormal termination of the currently executed program is detected by the program monitoring unit, executes the program selected by the second program selection unit.

Furthermore, the program execution device according to the present invention is a program execution device that executes a program, the program execution device including: a first program selection unit which selects, as a program to be executed, a program which is downloaded and executed; a program monitoring unit which monitors an operational state of a currently executed program; a second program selection unit which selects, as a program to be executed, a program that is of the same type as the currently executed program and which displays an electronic program guide, in the case where abnormal termination of the currently executed program is detected by the program monitoring unit; and an execution unit which executes the program selected by the first program selection unit and, in the case where abnormal termination of the currently executed program is detected by the program monitoring unit, executes the program selected by the second program selection unit.

[0018]   Note that the present invention can be realized not only as such a program execution apparatus but also as a program execution method having the characteristic units of such a program execution apparatus as steps, and as a program which causes a computer to execute such steps.   In addition, it goes without saying that it is possible distribute such a program via a recording medium

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such as a CD-ROM, a transmission medium such as the internet.

CLAIMS

[1]   (Amended) A program execution device that executes a program, said program execution device comprising:

a first program selection unit operable to select, as a program to be executed, a program which is downloaded and executed;

a program monitoring unit operable to monitor an operational state of a currently executed program;

a second program selection unit operable to select, as a program to be executed, a program that is of the same type as the currently executed program, in the case where abnormal termination of the currently executed program is detected by said program monitoring unit;

an execution unit operable to execute the program selected by said first program selection unit and, in the case where abnormal termination of the currently executed program is detected by said program monitoring unit, to execute the program selected by said second program selection unit;

a cause obtainment unit operable to obtain a cause of the abnormal termination of the program detected by said program monitoring unit; and

a countermeasure execution unit operable to execute a countermeasure based on the cause of the abnormal termination,

wherein said execution unit is operable to execute the program selected by said second program selection unit, after the countermeasure is executed by said countermeasure execution unit.

[2]   The program execution device according to Claim 1,

wherein said second program selection unit is operable to select, as the program to be executed, a program which is different from the program selected by said first program selection unit.

[3]   (Amended) The program execution device according to Claim

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wherein said second program selection unit is operable to select, as the program to be executed, a program which is the same as the program selected by said first program selection unit.

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[4]   The program execution device according to Claim 1,

wherein said second program selection unit is operable to select, as the program to be executed:

a program which is the same as the program selected by said first program selection unit, in the case where a predetermined condition is not satisfied; and

a program which is different from the program selected by said first program selection unit, in the case where the predetermined condition is satisfied.

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[5]   The program execution device according to Claim 4,

wherein said second program selection unit is operable to perform selection in the case where the predetermined condition is whether or not the number of abnormal terminations of the program which said program monitoring unit has detected as having abnormally terminated exceeds a predetermined number, and to determine that:

the predetermined condition is not satisfied in the case where the number of abnormal terminations of the program does not exceed the predetermined number; and

the predetermined condition is satisfied in the case where the number of abnormal terminations of the program exceeds the predetermined number.

30   [6]   The program execution device according to Claim 4,

wherein said second program selection unit is operable to perform selection in the case where the predetermined condition is

whether or not the number of times a program to be selected has been selected exceeds a predetermined number, and to determine that:

the predetermined condition is not satisfied in the case where the number of times the program has been selected does not exceed the predetermined number; and

the predetermined condition has been satisfied in the case where the number of times the program is selected exceeds the predetermined number.

[7]   The program execution device according to Claim 4,

wherein said second program selection unit is operable to perform selection under an assumption that time information is the predetermined condition.

[8]   The program execution device according to Claim 4,

wherein said second program selection unit is operable to perform selection under an assumption that:

the predetermined condition is whether or not an instruction from a user is received;

the predetermined condition is not satisfied in the case where the instruction from the user is not received; and

the predetermined condition is satisfied in the case where the instruction from the user is received.

[9]   The program execution device according to Claim 1,

wherein said second program selection unit is operable to select, as the program to be executed, a program in a non-volatile memory.

[10]   The program execution device according to Claim 1,

wherein one of said first program selection unit and said

second program selection unit is operable to select, as the program to be executed, a program that can be acquired via a network.

[11] The program execution device according to Claim 1, wherein one of said first program selection unit and said second program selection unit is operable to select, as the program to be executed, a program that is included in a broadcast wave.

[12] (Cancelled)

[13] The program execution device according to Claim 1, wherein said program monitoring unit is operable, upon detecting abnormal termination of the currently executed program, to present an occurrence of the abnormal termination to a user.

[14] The program execution device according to Claim 1, wherein said program monitoring unit is operable to present the abnormal termination occurrence to a user, using an LED display.

[15] The program execution device according to Claim 1, wherein said program monitoring unit is operable to present the abnormal termination occurrence to a user, using a display on a display screen.

[16] (Amended) A program execution device that executes a program, said program execution device comprising:
    a first program selection unit operable to select, as a program to be executed, a program which is downloaded and executed;
    a program monitoring unit operable to monitor an operational state of a currently executed program;
    a second program selection unit operable to select, based on an instruction from a user, a program that is of the same type as the

currently executed program, as a program to be executed, in the case where abnormal termination of the currently executed program is detected by said program monitoring unit; and

an execution unit operable to execute the program selected by said first program selection unit and, in the case where abnormal termination of the currently executed program is detected by said program monitoring unit, to execute the program selected by said second program selection unit.

[17]   The program execution device according to Claim 16, wherein said second program selection unit is operable to present selectable program candidates, and to select a program selected by the user, as the program to be executed.

[18]   The program execution device according to Claim 17, wherein said second program selection unit is operable to present, as the selectable program candidates, at least a program in a non-volatile memory.

[19]   The program execution device according to Claim 17, wherein said second program selection unit is operable to present, as the selectable program candidates, at least a program that can be acquired via a network.

[20]   The program execution device according to Claim 17, wherein said second program selection unit is operable to present, as the selectable program candidates, at least a program that is included in a broadcast wave.

[21]   The program execution device according to Claim 17, wherein said second program selection unit is operable to select a predetermined program, as the program, in the case where

the user does not make a selection within a predetermined time.

[22] (Amended) A program execution device that executes a program, said program execution device comprising:

5   a first program selection unit operable to select, as a program to be executed, a program which is downloaded and executed;

a program monitoring unit operable to monitor an operational state of a currently executed program;

a second program selection unit operable to select, as a
10   program to be executed, a program that is of the same type as the currently executed program and which accepts a channel selection request from a user and performs an operation, in the case where abnormal termination of the currently executed program is detected by said program monitoring unit; and

15   an execution unit operable to execute the program selected by said first program selection unit and, in the case where abnormal termination of the currently executed program is detected by said program monitoring unit, to execute the program selected by said second program selection unit.

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[23] (Amended) A program execution device that executes a program, said program execution device comprising:

a first program selection unit operable to select, as a program to be executed, a program which is downloaded and executed;

25   a program monitoring unit operable to monitor an operational state of a currently executed program;

a second program selection unit operable to select, as a program to be executed, a program that is of the same type as the currently executed program and which displays an electronic
30   program guide, in the case where abnormal termination of the currently executed program is detected by said program monitoring unit; and

an execution unit operable to execute the program selected by said first program selection unit and, in the case where abnormal termination of the currently executed program is detected by said program monitoring unit, to execute the program selected by said second program selection unit.

[24] (Amended) The program execution device according to any one of Claim 1, Claim16, Claim 22, and Claim 23,
wherein said program monitoring unit is operable to store information regarding the program which said program monitoring unit has detected as having abnormally terminated.

[25] The program execution device according to Claim 24,
wherein said program monitoring unit is operable to store the information in a removable recording medium.

[26] The program execution device according to Claim 24,
wherein said program monitoring unit is operable to transmit the information to an external destination.

[27] (Amended) A program execution method comprising:
a first program selection step of selecting, as a program to be executed, a program which is downloaded and then executed;
a program monitoring step of monitoring an operational state of a currently executed program;
a second program selection step of selecting, as a program to be executed, a program that is of the same type as the currently executed program, in the case where abnormal termination of the currently executed program is detected in said program monitoring step; and
an execution step of executing the program selected in one of said first program selection step and said second program selection

step;

a cause obtainment step of obtaining a cause of the abnormal termination of the program detected in said program monitoring step; and

5 a countermeasure execution step of executing a countermeasure based on the cause of the abnormal termination,

wherein, in said execution step, the program selected in said second program selection step is executed after the countermeasure is executed in said countermeasure execution step.

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[28] (Amended) A recording medium in which a program for executing an execution program is stored, the program causing a computer to execute:

a first program selection step of selecting, as an execution 15 program to be executed, an execution program which is downloaded and then executed;

a program monitoring step of monitoring an operational state of a currently executed execution program;

a second program selection step of selecting, as an execution 20 program to be executed, an execution program that is of the same type as the currently executed execution program, in the case where abnormal termination of the currently executed execution program is detected in said program monitoring step;

an execution step of executing the execution program 25 selected in one of said first program selection step and said second program selection step;

a cause obtainment step of obtaining a cause of the abnormal termination of the execution program detected in said program monitoring step; and

30 a countermeasure execution step of executing a countermeasure based on the cause of the abnormal termination,

wherein, in said execution step, the execution program

selected in said second program selection step is executed after the countermeasure is executed in said countermeasure execution step.

[29]   (New) A program execution method comprising:

5   a first program selection step of selecting, as a program to be executed, a program which is downloaded and then executed;

a program monitoring step of monitoring an operational state of a currently executed program;

a second program selection step of selecting, based on an

10   instruction from a user, a program that is of the same type as the currently executed program, as a program to be executed, in the case where abnormal termination of the currently executed program is detected in said program monitoring step; and

an execution step of executing the program selected in said

15   first program selection step and, in the case where abnormal termination of the currently executed program is detected in said program monitoring step, to execute the program selected in said second program selection step.

20   [30]   (New) A recording medium in which a program for executing an execution program is stored, the program causing a computer to execute:

a first program selection step of selecting, as an execution program to be executed, an execution program which is downloaded

25   and then executed;

a program monitoring step of monitoring an operational state of a currently executed execution program;

a second program selection step of selecting, based on an instruction from a user, an execution program that is of the same

30   type as the currently executed execution program, as an execution program to be executed, in the case where abnormal termination of the currently executed execution program is detected in said

program monitoring step; and

an execution step of executing the execution program selected in said first program selection step and, in the case where abnormal termination of the currently executed execution program
5 is detected in said program monitoring step, to execute the execution program selected in said second program selection step.

[31] (New) A program execution method comprising:

a first program selection step of selecting, as a program to be
10 executed, a program which is downloaded and then executed;

a program monitoring step of monitoring an operational state of a currently executed program;

a second program selection step of selecting, as a program to be executed, a program that is of the same type as the currently
15 executed program and which accepts a channel selection request from a user and performs an operation, in the case where abnormal termination of the currently executed program is detected in said program monitoring step; and

an execution step of executing the program selected in said
20 first program selection step and, in the case where abnormal termination of the currently executed program is detected in said program monitoring step, to execute the program selected in said second program selection step.

25 [32] (New) A recording medium in which a program for executing an execution program is stored, the program causing a computer to execute:

a first program selection step of selecting, as an execution program to be executed, an execution program which is downloaded
30 and then executed;

a program monitoring step of monitoring an operational state of a currently executed execution program;

a second program selection step of selecting, as an execution program to be executed, an execution program that is of the same type as the currently executed execution program and which accepts a channel selection request from a user and performs an operation, 5   in the case where abnormal termination of the currently executed execution program is detected in said program monitoring step; and

an execution step of executing the execution program selected in said first program selection step and, in the case where abnormal termination of the currently executed execution program 10   is detected in said program monitoring step, to execute the execution program selected in said second program selection step.

[33]   (New) A program execution method comprising:

a first program selection step of selecting, as a program to be 15   executed, a program which is downloaded and then executed;

a program monitoring step of monitoring an operational state of a currently executed program;

a second program selection step of selecting, as a program to be executed, a program that is of the same type as the currently 20   executed program and which displays an electronic program guide, in the case where abnormal termination of the currently executed program is detected in said program monitoring step; and

an execution step of executing the program selected in said first program selection step and, in the case where abnormal 25   termination of the currently executed program is detected in said program monitoring step, to execute the program selected in said second program selection step.

[34]   (New) A recording medium in which a program for executing 30   an execution program is stored, the program causing a computer to execute:

a first program selection step of selecting, as an execution

program to be executed, an execution program which is downloaded and then executed;

a program monitoring step of monitoring an operational state of a currently executed execution program;

5   a second program selection step of selecting, as an execution program to be executed, an execution program that is of the same type as the currently executed execution program and which displays an electronic program guide, in the case where abnormal termination of the currently executed execution program is detected
10   in said program monitoring step; and

an execution step of executing the execution program selected in said first program selection step and, in the case where abnormal termination of the currently executed execution program is detected in said program monitoring step, to execute the
15   execution program selected in said second program selection step.